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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/043,362	01/09/2002	Warren M. Farnworth	4212.IUS (99-0306.1)	7080

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EXAMINER

ZARNEKE, DAVID A

ART UNIT PAPER NUMBER

2827

DATE MAILED: 04/14/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/043,362

Applicant(s)

FARNWORTH, WARREN M.

Examiner

David A. Zarneke

Art Unit

2827

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____ 6) ☐ Other: ____.

DETAILED ACTION

Response to Arguments

Applicant's arguments filed 2/12/03 have been fully considered but they are not persuasive.

Applicant presented three arguments pertaining to the examiner's rejection of claims.

The first argument is that Reiff does not teach the use of a hermetic material, as in claims 1 and 14. Applicant states on page 3 of his response "Conventionally, materials such as metals, ceramics, and glass have been used to form hermetic packages, with welding, brazing, solder, and glass sealing being used to secure the elements of a hermetic package to one another. Tummalla, at page 51."

Reiff teaches that the material to be stereolithographically deposited is a metal, a plastic powder or a liquid photopolymer (2, 62+).

Therefore, Reiff does indeed teach the use of a hermetic packaging material because Applicant states that a metal is a hermetic material.

The second argument is that Reiff does not teach the chip carrier being made of a metal or ceramic, as in claims 9 and 19.

The examiner points out to the applicant that claims 9 and 19 refer to the hermetic packaging material, not the chip carrier, is a metal or ceramic.

Therefore, the examiner's rejection of claims 9 and 19 is correct.

The third, and final argument, pertaining to claims 8, 10 and 18 presented by the applicant is that the liquid photopolymer of Reiff is not a hermetic material, therefore there is no reason to combine the hermetic packaging materials of Sanford, Eberlein, Finkelsten, Muller, or Suddick.

As noted above, though Reiff does indeed teach the use of a non-hermetic material, Reiff also teaches the use of a metallic material, which is hermetic in nature. Therefore Reiff is combinable with Sanford, Eberlein, Finkelsten, Muller, or Suddick.

Consequently, all of the rejections presented by the examiner in the previous office action are upheld and are repeated below.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-4 and 9 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Reiff et al., US Patent 5,173,220.

Reiff teaches a 3D plastic article comprising:

a connection element (carrier substrate 74);

a semiconductor die (72) operably connected to the connection element;

and

a hermetic package sealing the die from the environment comprising a plurality of superimposed, contiguous, mutually adhered layers of a hermetic packaging material (76), such as a metal powder (2, 62+) [Figure 4].

Regarding claim 2, Reiff teaches the connection element to be a carrier substrate (4, 52+).

With respect to claim 3, Reiff teaches the surface of the die being disposed against the carrier substrate (4, 52+).

As to claim 4, Reiff teaches the hermetic packaging material as covering the die (Figure 4).

Regarding claim 9, Reiff teaches the hermetic material can be a metal powder (2, 58+).

Claims 14-16 and 19 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Reiff et al., US Patent 5,173,220.

Reiff teaches a 3D plastic article comprising:

hermetically sealing a die (72) from the environment comprising a plurality of superimposed, contiguous, mutually adhered layers of a hermetic packaging material (76) [Figure 4].

Regarding claims 15-17, Reiff teaches a receptacle (carrier substrate 74) to receive the die and seal the die from the environment external from the package, wherein the receptacle also is covered with the hermetic packaging material (Figure 4).

With respect to claim 19, Reiff teaches the hermetic packaging material can be a metal powder (2, 58+).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 5-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Reiff et al., US Patent 5,173,220, as applied to claim 1 above, and further in view of Eberlein, US Patent 5,086,334, or Suddick, US Patent 3,325,586.

Reiff, relied upon as discussed above, fails to teach the use of a lead frame as the connection element.

Eberlein and Suddick teach encapsulating dice attached to leadframes with a glass (Figures).

It would have been obvious to one of ordinary skill in the art at the time of the invention to use the leadframes of Eberlein or Suddick as the connection element of Reiff because the use of a leadframe in place of a carrier substrate is an obvious matter of design choice. Design choices and changes of size are generally recognized as being within the level of ordinary skill in the art (MPEP 2144.04(d)).

Regarding claim 6, Eberlein and Suddick teach encapsulating the dice (Figures).

With respect to claim 7, Eberlein and Suddick teach encapsulating the dice and a portion of the leadframe (Figures).

Claims 8 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Reiff et al., US Patent 5,173,220, as applied to claims 1 and 14 above, and further in view of Sanford, US Patent 4,314,031, or Eberlein, US Patent 5,086,334, or Finkelstein et al., US Patent 5,013,360, or Muller, US Patent 4,133,690, or Suddick, US Patent 3,325,586.

Reiff, relied upon as taught above, fails to teach the use of a thermoplastic glass as the hermetic packaging material.

While Reiff only teaches the hermetic material can be a plastic (2, 58+) without giving an direction regarding specific types of plastics, the use of thermoplastic glasses is conventionally known in the art to be used as a hermetic packaging material. The use of conventional materials to perform there known functions in a conventional process is obvious. In re Raner 134 USPQ 343 (CCPA 1962).

This conventionality is proven by Sanford, US Patent 4,314,031, which teaches that Sn-P oxyfluoride glasses can be used for sealing electronic circuit components (2, 5+), along with Eberlein, US Patent 5,086,334, Finkelstein et al., US Patent 5,013,360, Muller, US Patent 4,133,690, and Suddick, US Patent 3,325,586, all of which teach the use of glasses to encapsulate electronic circuits.

Claims 10-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Reiff et al., US Patent 5,173,220, in view of Sanford, US Patent 4,314,031, or Eberlein, US Patent 5,086,334, or Finkelstein et al., US Patent 5,013,360, or Muller, US Patent 4,133,690, or Suddick, US Patent 3,325,586.

Reiff, relied upon as taught above, fails to teach the use of a thermoplastic glass as the hermetic packaging material.

While Reiff only teaches the hermetic material can be a plastic (2, 58+) without giving an direction regarding specific types of plastics, the use of thermoplastic glasses is conventionally known in the art to be used as a hermetic packaging material. The use of conventional materials to perform there known functions in a conventional process is obvious. In re Raner 134 USPQ 343 (CCPA 1962).

This conventionality is proven by Sanford, US Patent 4,314,031, which teaches that Sn-P oxyfluoride glasses can be used for sealing electronic circuit components (2, 5+), along with Eberlein, US Patent 5,086,334, Finkelstein et al., US Patent 5,013,360, Muller, US Patent 4,133,690, and Suddick, US Patent 3,325,586, all of which teach the use of glasses to encapsulate electronic circuits.

Regarding claims 11, Reiff teaches the carrier substrate being connected to the die (figure 4).

With respect to claim 12, Eberlein and Suddick both teach the substrate as being a leadframe (figures).

As to claim 13, Reiff teaches electrically connecting the die bond pads to the substrate using bond wires (Figure 4).

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this action should be directed to examiner David Zarneke at (703)-305-3926. The examiner can normally be reached on M-F 10AM-6PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David L. Talbott can be reached on (703)-305-9883. The fax phone numbers for the organization where this application is assigned are (703)-308-7722 for regular communications and (703)-308-7721 for After Final communications.

Any inquiry of a general nature or relating to the status of this application should be directed to the receptionist whose telephone number is (703)-308-0956.

David A. Zarneke
April 8, 2003

